FINAL REPORT FOR THE NASA ASTROPHYSICS DATA SYSTEM GRANT

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CENTER FOR ASTROPHYSICS AND SPACE ASTRONOMY
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Project Overview

The NASA Astrophysics Data System (ADS) is a free software package that puts the disparate data, collected by NASA Space Missions, and stored on disparate platforms at NASA research centers and university facilities across the nation, into the hands of the scientific community in an efficient and effective manner. The ADS offers a novel approach to the problem of dealing with large quantities of geographically distributed and heterogeneous data from a broad range of astrophysics missions- past, present, and future. In this era of multi-disciplinary studies, it is imperative that scientific researchers have convenient and uniform access to relevant and current data regardless of where or how it is physically maintained. The ADS provides this access, and a variety of tools and services to inform users of available data, and to facilitate the manipulation and analysis of this data.

The following is a brief overview of the activities completed for the NASA Astrophysics Data System contract during fiscal years 1991 and 1992 (1-October-1990 thru 30-September-1992).

CASA Specific Tasks

1. Quality Assurance and Testing:

   CASA acted as the Testing and QA center for the ADS Project. The focus of these test and QA services were to ensure that ADS services are scientifically useful and relevant and to insure that the system interfaces are usable and coherent to working members of the astrophysics community.

2. Documentation Development and Validation:

   CASA's responsibilities included documentation verification and generation for each new release of the ADS and for modifications associated with bug fixes. We also created and maintained the configuration controlled Documentation Libraries.

3. System Integration and Release Building:

   CASA served as the focal point of the project in integrating system services, core developments, and documentation in order to build the final operation versions.

4. Catalog and Database Maintenance and Installation:

   CASA provided access to over 70 astronomical catalogs maintained on our DECstation 5000 workstation using the Ingres Relational Database Management System. We defined the documentation standards for catalog documentation and assisted other nodes in bringing their catalogs on-line through the ADS.

Timeline of Major Events

The number of registered users for the ADS went from essentially the participating project members ($\tilde{2}0$) in 1990 to over 2300 users world wide. This large increase is primarily due to the release of the graphical user interface version of the ADS in November 1992. Some of the events leading up to this release are listed below:

1. First ADS workshop at CU - July 1990.
2. ADS User's Group meeting at Johns Hopkins University - October 1990.
3. The first operational version of the ADS (v2.x) released in January 1991 provided access to over a dozen remotely maintained catalog databases using a curses based user interface.
4. Evolution of the system continued rapidly with the release of the graphical user interface version of the ADS (ADS V3.1) in November of 1992. This version provided an easy-to-use point and click X11/Motif based user interface with access to over 120 catalogs, 125,000 NASA/STI astronomy and astrophysics abstracts, SIMBAD, NED, NODIS, and HEASARC Browse.

Staffing

The staffing for the ADS project at CASA increased as new tasks and funds were delegated. A brief listing of members of the CASA ADS staff, their start date with the ADS project, and their primary responsibilities are listed below:

1. Dr. Edward Brugel (October 1989) - Dr. Brugel served as Principal Investigator for the CASA ADS contract until August of 1992.
2. Alice Bertini (June 1990) - Ms. Bertini, a Senior Professional Research Assistant, provided programming expertise and technical management.
3. Michelle Neves (October 1991) - Ms. Neves, a Professional Research Assistant, provided programming expertise associated with the core interface, system integration, testing, and release building.
4. Gregg Allison (October 1992) - Mr. Allison, a Professional Research Assistant, developed services associated with new catalogs, archives, and graphical visualization.
5. Jacque Anderson (April 1993) - Ms. Anderson, a Professional Research Assistant, developed essentially all of the ADS documentation for the project. She also provided user support.
6. Sally Schaller (August 1992) - Ms. Schaller, a Professional Research Assistant, provided front-line user support and assisted Ms. Anderson with documentation development.
7. Brian Drake (June 1992) - Mr. Drake, an undergraduate assistant, provided computer programs for generating databases, documentation, and user registration.

Equipment

A substantial amount of computer equipment was purchased during the period of the ADS contract. This equipment continues to be used for ADS work. A list of the equipment and the date of acquisition is included below:

1. menkar.colorado.edu (June 1989) Packard Bell IBM PC clone
2. cetus.colorado.edu (June 1989) DECstation 3100
3. helios.colorado.edu (July 1990) Sun SPARCstation 1+
4. subway.colorado.edu (March 1992) HP/Apollo 9000 model 710
5. puppis.colorado.edu (Feb 1992) Sun SPARCstation 2
6. cuads.colorado.edu (June 1992) DECstation 5000
7. calypso.colorado.edu (Sept 1992) Sun SPARCstation IPC